

N109 W13300 ELLSWORTH DRIVE GERMANTOWN, WI 53022  
262-253-5900 FAX 262-253-5919

**DESCRIPTION:**

*Resinlab*<sup>®</sup> *UR6000 Black* is a lower cost two-part flame retardant urethane suitable for potting and encapsulation of electronic devices. It was formulated to a 4:1 by volume ratio for ease of use in automatic mixing equipment and is available in both bulk and cartridge format. This low viscosity formulation gels in less than 30 minutes at a volume of 150 mL and reaches full cure within 72 hours at room temperature. Higher temperatures will accelerate cure.

*UR6000 Black* is recognized under the Component Recognition Program of Underwriters Laboratories Inc., (File# E186034) for UL Standard 94. *UR6000 Black* qualifies for a vertical burn rating of V-0 at 6mm thickness. It has good adhesion to multiple substrates and moderate thermal conductivity.

This formula contains soft, low-abrasion fillers which can separate over time, although they have good resistance to hard settling.

**TYPICAL PROPERTIES:**

All properties given are at 25 °C unless otherwise noted.

<b>Property:</b>	<b>Value:</b>	<b>Test Method or Source:</b>
<b>Color</b>	Black	Visual
<b>Mix Ratio</b>	Part A to Part B	Calculated
<b>Mix Ratio by weight</b>	5.03 to 1	
<b>Mix Ratio by volume</b>	4 to 1	
<b>Cure Schedule</b>	72 hrs @ 25 °C 2 hrs @ 65 °C 30 min @ 100 °C	
<b>Viscosity - Part A</b>	18,000 cP	TA HR20 Rheometer 25mm parallel plate @
<b>Viscosity - Part B</b>	400 cP	1/s DCV6100723
<b>Viscosity - Mixed</b>	5,000 cP	
<b>Specific Gravity - Part A</b>	1.55	Calculated
<b>Specific Gravity - Part B</b>	1.23	
<b>Specific Gravity - Mixed</b>	1.48	
<b>Pot Life defined as the time it takes for initial mixed viscosity to double</b>	4 minutes	TA HR20 Rheometer parallel plate 25mm @ 1/s DCV6100723
<b>Gel Time 150cc Sample</b>	25 minutes	455300005339/Gardco Gel Timer
<b>Peak Exotherm</b>	35 °C for 40 mL sample	455300005593 by Type K thermocouple
<b>Hardness</b>	70 Shore D	455300006287/ASTM D2240
<b>Glass Transition Temperature/Tg</b>	27 °C	453560822409 by DSC
<b>Water Absorption</b>	0.1 %	24 hr immersion 457561824543/ASTM D570

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<b>Property:</b>	<b>Value:</b>	<b>Test Method or Source:</b>
<b>Tensile Properties:</b>		4535601224470/ASTM D638
<b>Strength</b>	1,850 psi	
<b>Elongation</b>	20 %	
<b>Modulus</b>	104,000 psi	
<b>Compressive Properties:</b>		4535601224467/ASTM D695
<b>Yield Strength</b>	15,500 psi	
<b>Ultimate Strength</b>	15,500 psi	
<b>Modulus</b>	36,000 psi	
<b>Flame Resistance UL Certified, File #E186034</b>	Passes with V-0 Rating @ 6.0 mm	45376013225560/UL94V
<b>Thermal Conductivity by Transient Plane Heat Source (TPS)</b>	0.62 W/m.K	Thermtest TPS Hot Disk ISO 22007-2 45376013225604
<b>Electrical Resistivity:</b>		455300006612/ASTM D257 @ 18 °C @ 23 %RH
<b>Volume</b>	1.4 x 10 <sup>15</sup> ohm-cm	
<b>Surface</b>	1.7 x 10 <sup>16</sup> ohm/sq	
<b>Dielectric Constant &amp; Dissipation Factor:</b>	$\epsilon'$	$\tan \delta$
<b>@ 100 Hz</b>	4.0	0.03
<b>@ 100 kHz</b>	3.7	0.02
<b>AC Dielectric Strength</b>	15.1 kV/mm	DCV6101609; ASTM D149 Method A, immersed in ASTM D3487 Type II Oil Specimen thickness was ~1-3 mm
<b>Coefficient of Thermal Expansion by TMA:</b>		455300005340/ASTM E831 TMA, 5 °C/min
<b>below Tg</b>	65 ppm/°C	
<b>above Tg</b>	160 ppm/°C	
<b>Operating Temperature Range</b>	-40 to 125 °C**	
<b>Relative Thermal Index (RTI)</b>	50 °C	UL746B, Table 7.1 Generic Value Based on Composition

\* Asterisk denotes values considered typical to associated resin systems or extrapolated from other test results.

\*\* Operating Temperature Range is based on average design requirements and is not intended as a guarantee of suitability for all applications operating at that temperature.

\*\*\* This TDS contains values that have been updated. The values reported in this technical data sheet are typical values of the product, and are highly dependent on test conditions and methodology. We actively seek the most precise and accurate ways to measure and interpret performance of our products, and to update estimated values with measured values. The formula has not been revised or changed in any way. Although the values on paper have changed, you can expect the same performance of the product.

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**Additional Performance Data – Lap Shear Adhesion, 4535601224468/ASTM D1002:**

<b>Substrate Type</b>	<b>Strength</b>	<b>Test Temperature</b>	<b>Cure Schedule</b>	<b>Bond Line Thickness</b>
Al to Al	1,400 psi	25 °C	3 hr @ 65 °C	0.010 "
SS to SS	1,050 psi	25 °C	3 hr @ 65 °C	0.010 "
PC to PC	475 psi	25 °C	3 hr @ 65 °C	0.010 "
Acrylic to Acrylic	250 psi	25 °C	3 hr @ 65 °C	0.010 "
PVC to PVC	500 psi	25 °C	3 hr @ 65 °C	0.010 "
ABS to ABS	300 psi	25 °C	3 hr @ 65 °C	0.010 "

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**INSTRUCTIONS:**

1. Bring to room temperature prior to use.
2. Cartridge format: Mixer should be attached keeping the cartridge vertical and any air pocket purged this way. After the mixer contains material, the mixer tip can be dropped to dispense pre-bleed amount. Attach a new static mixer with each cartridge, then pre-bleed the first 3 inches of dispensed material or until a uniform color is obtained. Maintain adequate velocity during dispensing to ensure complete mixing.
3. Bulk format: stir until homogeneous weigh and mix parts A and B accurately and thoroughly, scraping sides of container often. A power mixer is suggested such as a 500-1000 rpm device with a mix paddle sufficient to turn material and disperse any filler. Do not pour from mixing container, transfer to a new container as residual unmixed material may cause a tacky spot on the surface of the casting. Maintain adequate velocity during dispensing to ensure complete mixing.
4. Allow to cure undisturbed until product is fully gelled or tack-free to the touch.
5. Clean up uncured resin with suitable organic solvent such as MEK or acetone.

**SHELF LIFE AND STORAGE:**

3 months DOP at 5 °C in cartridges that are foil bagged and desiccant packed.

Store cartridges horizontally.

Invert cartridges every two weeks.

6 months at 25 °C Bulk.

Specialty packaging may be less.

Bulk containers should be inverted every two to three weeks to reduce the accumulation of the fillers on the bottom of the containers.

This system is prone to settling due to high filler content. Inventory should be rotated on a FIFO (first in, first out) basis.

Isocyanates are sensitive to moisture and should be kept in their original container or in a volume tank under dry nitrogen blanketing. Many isocyanates are prone to dimerization, the formation of a white precipitate. Products with minor amounts of this precipitate normally cure to full properties. Storage at 20 - 30 °C (68 °F to 86 °F) is recommended to ensure full shelf life.